# An overview of 49 volumes of the Netherlands Journal of Agricultural Science

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## Introduction

The Netherlands Journal of Agricultural Science started in 1953. In the preface to the first issue (February 1953), in which the journal was introduced, Professor Schuffelen, Chairman of the Netherlands Society for Agricultural Sciences, commented that the official publication of this Society – the former Landbouwkundig Tijdschrift – was mainly in Dutch and therefore not accessible to foreigners. The Society wanted to advance agricultural science by stimulating Dutch scientists to publish in a universal language. Three arguments were given for this. First, the standards of Dutch agriculture were high, and foreigners apparently needed to know more about it. Second, Dutch agricultural scientists had a wide experience in the field of tropical agriculture, and apparently should share this with their foreign colleagues. Third, there was a need of increasing international contact. So it was decided to inspire more Dutch scientists to publish in English and for that purpose a new, Dutch journal published in the English language was desirable. The focus of this new journal would be the entire field of agricultural science.

Five matters were considered important for the nature of this new journal, the Netherlands Journal of Agricultural Science (NJAS):

1. Apparently NJAS was seen as the English counterpart of a journal in Dutch that already existed for many years. In fact in 1953, when NJAS was launched, the 65th volume of the Landbouwkundig Tijdschrift was published. Later, the nature of this journal changed when the need for an agricultural research journal in Dutch was no longer felt. In its early years the nature of NJAS was obviously similar to that of the Landbouwkundig Tijdschrift.
2. Dutch agriculture was of a high standard but agricultural science was very inward

looking and Dutch oriented. Within the European scientific community after World War II it was widely felt that more exchange of information was needed. Many European scientific societies and associations were founded – for example the European Association for Potato Research – but also other regional European ones wanted to open up.

3. It was believed that the Dutch agricultural scientific community mainly had something to contribute to agricultural science of the tropics. The large plantations in the tropical colonies of the Netherlands (mainly Indonesia, but also New Guinea, Suriname and the Dutch Caribbean) were supported by scientific institutions. The Agricultural University of Wageningen had a strong focus on tropical agriculture, tropical forestry, tropical crops, and soils in the tropics.
4. The scope of the new journal was very wide. The size of each volume was limited: the aim was about 300 pages per year. This automatically meant that the readership was to have a broad interest and that specific topics would be spread thinly over volumes.
5. The authorship should be typically Dutch: the journal was mainly meant to offer a platform to Dutch agricultural scientists, although occasionally foreign authors also published in NJAS, mostly in special issues.

Below we will comment on the realization of some of these goals.

## Editorial policy

Although NJAS was mainly meant as a medium to publish results of research, certainly in the early years it also provided general information. Recent publications were either reviewed or merely described or listed. This was done until the end of Volume 14 (1966). Volume 15 (1967) no longer contained lists of recent publications, as the PUDOC Bulletin was offered as an alternative, but book reviews still remained to be published. Later on, book reviews became incidental and at least during the last 15 volumes none was published anymore.

Short communications were also popular in the early years. Later the journal became attractive for authors also because it offered the possibility to publish long and sometimes very long papers, although costs of excessive pages were charged to the author(s). In recent volumes papers longer than 15 pages were very frequent.

The original scope of the journal was wide: the whole field of agricultural science. Volume 32 (1984), however, started with the announcement that the scope of the journal would be widened even further: from human nutrition to microbiology and from animal husbandry to rural sociology. This did not result in a sudden shift in the journal's contents. At the same time it was decided to start with synoptic publishing, with the first synopsis already published in Volume 32, Issue 1. A synopsis was defined as a concise 2-page paper in which the essentials of materials and methods, results and conclusions of a complete piece of research are given. The goal was to expose grey literature in an efficient way. Grey literature was defined as reports with a limited circulation, produced under the control of a research institution or a research worker,

and mostly containing detailed information that is of value to a limited group of specialists only. A synopsis was considered an original publication and was covered by abstract journals. Expectations were that at least 100 synopses would be published in NJAS per volume. That development lasted seven volumes: Volume 38 (1990) was the last one containing synopses. The peak was 27 synopses in one volume, which is well below the 100 expected. In an editorial to the first issue of Volume 39 (1991) the editor-in-chief concluded that it was no longer justified to continue publishing synopses as the number submitted and published was much lower than expected. Furthermore, the number of requests for the full reports was very low, the quality of the synopses was variable, there were several cases of double publishing and the scope of NJAS had not really been extended.

## An analysis of the contents of 49 volumes of NJAS

### Methodology

On the occasion of this 50th volume we wanted to produce overviews of progress in the most prominent disciplines of Dutch agricultural science. As a sort of introduction we reviewed the trends in the contents of the previous 49 volumes and analysed the impact of the papers published therein.

All issues of the 49 volumes were reviewed independently by the first two authors of this paper. After a few try-outs all papers were classified using four different classification systems.

The first classification was into the topic of research: plant, animal or soil. The second classification was based on the agro-ecological and socio-economic environment for which the research was intended to produce relevant results: either for tropical regions or for non-tropical regions. The third classification was based on the nature of the paper: either descriptive, methodological, or research oriented. Finally we counted the number of scientific reviews, synopses and original contributions.

Classifications were made independently and after comparing the results a final classification was agreed upon. The results will be presented by using moving 5-year averages.

We also recorded the publication of special issues, the use of different languages, the number of papers and pages per volume and the average length of the papers.

Data on the impact factors for the last 10 years were taken from the International Science Institute (ISI), Journal of Citation Reports (JCR). Various versions of the JCR were used, on microfiche (1991–1993), CD-ROM (1994–1996) and for the last four years the Web edition. More detailed information for the citation analysis of the individual papers was taken from ISI Science Citation Indexes that are available at Wageningen University and Research Centre since 1988 through the Web of Science platform.

## Languages

Papers were supposed to be written in a universal language. Obviously it was meant that this should be English. Nevertheless, incidentally papers were also published in German (IIx), French (5x), Spanish (Ix) and even Esperanto (Ix). Especially in Volumes 4 (1956) and 13 (1965) non-English papers were published. After Volume 30 (1982) no papers were published in any other language but English.

## Special issues

Frequently a special issue was published. In the early years special issues were published when a certain topic deserved special attention, for example because of an international conference in Wageningen. Later, special issues were also published to honour a distinguished professor who retired, or to commemorate the anniversary of an institute, organization or facility. The last 20 volumes mainly contained special issues that were paying attention to specific topics or disciplines. In total 28 special issues have been published so far. Of these 28 special issues, 12 were related to plant science (horticultural topics being dominant), 6 to soil science, 3 to animal science and the remaining 7 to miscellaneous topics. Out of the 28 special issues only 2 were related to agriculture in the tropics.

## Number of pages, number of papers and number of pages per paper

The original aim was to publish volumes with about 300 pages. From Volume 32 (1984) onwards it was indicated that a volume would contain about 400 pages (30 papers).

Figure 1 shows that the first issues were shorter than announced, but the number of papers per volume gradually increased. Later the moving 5-year average slightly decreased and stabilized at levels between 290 and 310 for about 10 volumes. For at least the last 15 volumes, the number of pages was closer to 400 than to 300. Especially during the early 1990s, volumes with more than 400 pages were normal. Currently the number of pages is about 360 per volume.

The number of papers has been very sensitive to the production of special issues. But in general about 30 papers were published per volume (Figure 1). Figure 2 shows the trend over time of the number of papers per volume, split up into normal contributions and synopses. After Volume 31 (1983) the number of papers per volume (excluding the synopses) started to increase rapidly, reaching a peak of about 40 in Volumes 35 (1987) and 36 (1988). Since then the number of papers per volume declined to about 25.

The first synopses were published in Volume 32 (1984). Their number rapidly increased up to a peak of 27 in Volume 33 (1985). As it was decided to stop this option, the number declined with the same rate until the last one was published in Volume 38 (1990).

Originally the number of pages per paper was close to the 10 pages that were aimed at (Figure 1). Around Volume 12 (1964) there was a period during which a

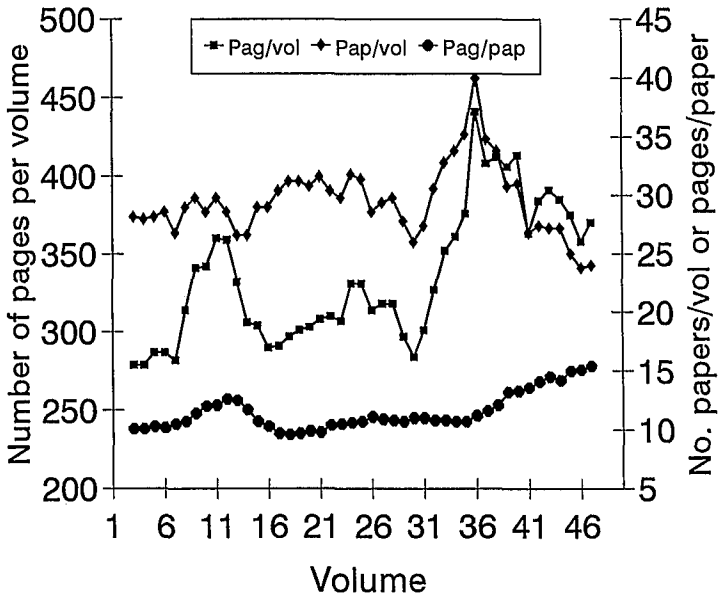


Figure 1. Trend over time (moving 5-year averages) of the number of pages per volume (■), the number of papers per volume (◆) and the average number of pages per paper (●) in the 49 volumes of the Netherlands Journal of Agricultural Science published so far.

temporary increase to over 12 pages per paper was observed. Later this figure more or less stabilized between 9 and 11 pages per paper. During the last decade, however, the average length has gradually increased to above 15 pages per paper.

## Disciplines

Announced as a journal in the field of agricultural sciences we classified the papers into plant science, animal science (domestic animals only) and soil science. The sum of these categories was usually well below 100% as many papers were on other aspects as well, such as machinery, animal housing and chemical crop protectants.

Plant sciences have always been dominant in NJAS, although the trend of the proportion of papers on plant science is erratic (Figure 3). The moving averages from Volumes 20 (1972) to 32 (1984) are well above the values of the early volumes and the latest volumes. The proportion of papers on animal science was low in the early years, but increased from 6 to 27% over the Volumes 24 (1976) to 40 (1992), followed by a decline over the last 10 volumes. Soil science has been high around Volume 10 (1962) but since then the proportion of papers on soil science gradually declined until almost 0% in the 1990s. Lately the proportion increased again to 10%. Figure 3 suggests a fixed pattern of increases and decreases in the proportion of papers on soil science with a phase of the peak of about 12 years. The reasons behind this fixed pattern are unclear.

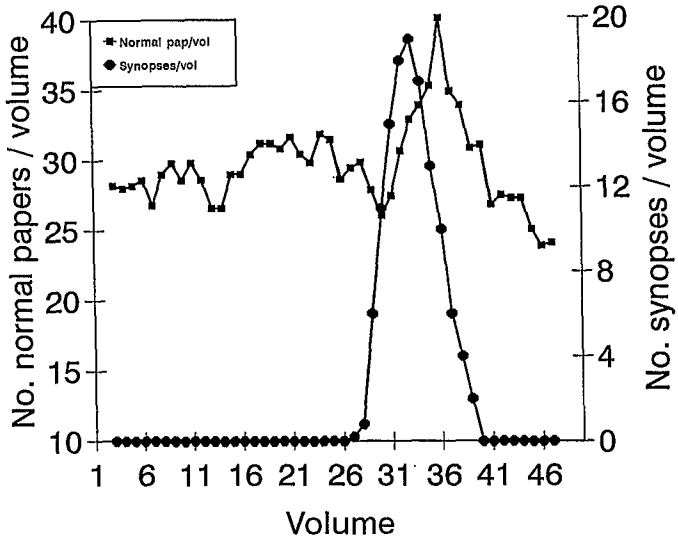


Figure 2. Trend over time (moving 5-year averages) of the number of normal papers per volume (■) and the number of synopses per volume (●) in the 49 volumes of the Netherlands Journal of Agricultural Science published so far.

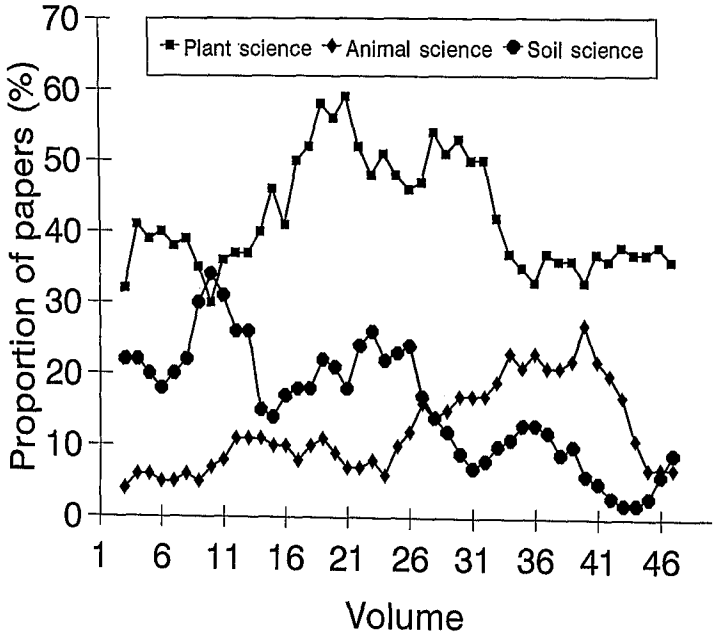


Figure 3. Trend over time (moving 5-year averages) of the proportion of papers on plant science (■), animal science (◆) or soil science (●) in the 49 volumes of the Netherlands Journal of Agricultural Science published so far.

## Agro-ecological and socio-economic environment

In the preface to the journal's first issue Professor Van Schuffelen stated that Dutch scientists had a lot to offer in the field of tropical agriculture. Figure 4 shows the trend over time of the proportion of papers on tropical issues. Note that papers were only called tropical if indeed the aims and topics were related to tropical issues. A paper on rice or other crops commonly grown in the tropics could still be classified as non-tropical if there were no clear indications that results were applicable to the tropics only. The proportion of papers related to the tropics increased from almost 20% in the first issues to more than 25% in the Volumes 5 (1957) to 11 (1963), but then gradually declined (with a temporary increase at the end of the 1970s) to considerably less than 10% in the Volumes 27 (1979) to 40 (1992). During the last 10 years the proportion increased again to about 25%, probably as a result of an increase in the number of foreign students pursuing their PhD degree in Wageningen and a focus of many scientists on tropical issues as agriculture in the western world is in the decline.

## Nature of papers

The Netherlands Journal of Agricultural Science was first presented as a follow-up of the Landbouwkundig Tijdschrift, containing many descriptive papers. Indeed the proportion of descriptive papers in the first 10 volumes was considerable (Figure 5), but gradually declined until close to 0% later on. The proportions of review papers and papers on methodology did not show very clear trends and were generally low. As a result the proportion of research papers – which was between 50 and 60% in the first 10 volumes – gradually increased to more than 80% in the Volumes 19 (1971) to 21 (1973). After a temporary decrease caused by an increase in methodological papers, the proportion of research papers stabilized between 80 and 90%, making NJAS a scientific journal with mainly research reports.

## Impact and citation analysis

Over the period 1991–2000 the Impact Factor of NJAS gradually increased from 0.265 to 0.625 (Figure 6). Exceptional years were 1992 – with a peak of 0.896 – and 1999, with a local minimum of 0.389. In the group of about 100 agricultural science journals, NJAS ranked 36 on average over the period 1991–1999. In 2000, the International Science Institute regrouped the agricultural science into agriculture and agronomy. In the strongly reduced group of journals on agriculture NJAS ranked 8.

Beside the Impact Factor it is also interesting to assess in which journals NJAS has been cited most frequently. An analysis of journal titles that made citations to NJAS articles in the period 1991–2000 revealed that NJAS was cited in 236 different journals. It was cited most in NJAS itself, accounting for nearly 13% of all citations. The top 10 journals apart from NJAS that cited NJAS articles are listed in Table 1, from which it becomes clear that NJAS was cited in a wide range of journals ranging from plant science, plant nutrition and nutrient cycling to animal science and agricultural engineering. In fact the regrouping of agricultural science journals by ISI in 2000 was

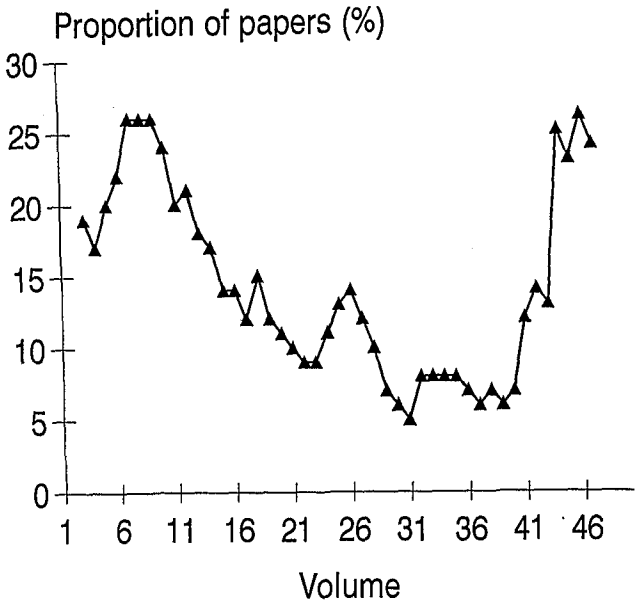


Figure 4. Trend over time (moving 5-year averages) of the proportion of papers on tropical issues in the 49 volumes of the Netherlands Journal of Agricultural Science published so far.

based on rather arbitrary grounds; three of the top 10 citing journals were placed in another group than NJAS.

Over the period for which bibliographic data were available (1987–2001), the

Table 1. The top 11 journals in which NJAS articles have been cited most frequently and the percentage of citations per journal over the period 1991–2000.

| Title of journal | Proportion of citations (%) |
|---|---|
| Netherlands Journal of Agricultural Science | 12.8 |
| Plant and Soil | 4.5 |
| Agricultural Systems | 3.2 |
| Nutrient Cycling in Agroecosystems | 3.0 |
| Animal Feed Science Technology | 2.5 |
| Journal of Dairy Science | 2.5 |
| European Journal of Agronomy | 2.2 |
| Agriculture, Ecosystems & Environment | 1.8 |
| Journal of Agricultural Engineering Research | 1.8 |
| Field Crops Research | 1.6 |
| Other journals | 64.3 |

review paper by R. Brouwer (1983) on the functional equilibrium in plants was cited most: 137 times over the last 14 years, or 9.8 times per year. One of the original research papers by R. Brouwer (1962) was cited very frequently too, ranking fourth on the list of most cited papers (Appendix). This can be considered an extremely high score for such an old paper. Other toppers were those by J. Goudriaan & H.E. De Ruiter (1983) on plant growth response to $CO_2$ enrichment (129 times over the last 14 years), and the paper on plant competition in mixed cropping systems by C.J.T. Spitters (1983) (cited 119 times over the last 14 years). In the top four of most frequently cited papers, three were published in 1983.

To be able to compare relatively recent with older articles we looked at the average number of citations per year over the last 14 years, or over the period since the year of publication. The paper by Aarts *et al.* (1999) has already been cited 15 times over the last three years or 5 times per year. The 25 most frequently cited papers over the period 1987–2001 are listed in the Appendix.

Eleven out of the twenty-five most frequently cited papers deal with plants, 7 deal with animals, 6 with soil and 1 is on meteorology. This is definitely not a random sample of the journal's contents (see Figure 5).

## Conclusions and outlook

The contents of NJAS change continuously. Its image is probably not so clear and the

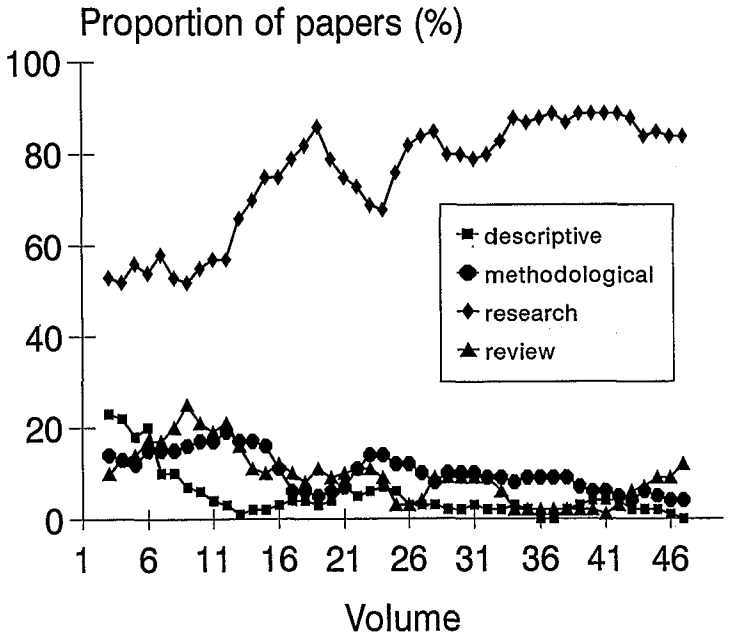


Figure 5. Trend over time (moving 5-year averages) of the proportion of papers that have a descriptive (■), a methodological (●) or a typically research-oriented nature (◆) or that can be classified as research reviews (▲) in the 49 volumes of the Netherlands Journal of Agricultural Science published so far.

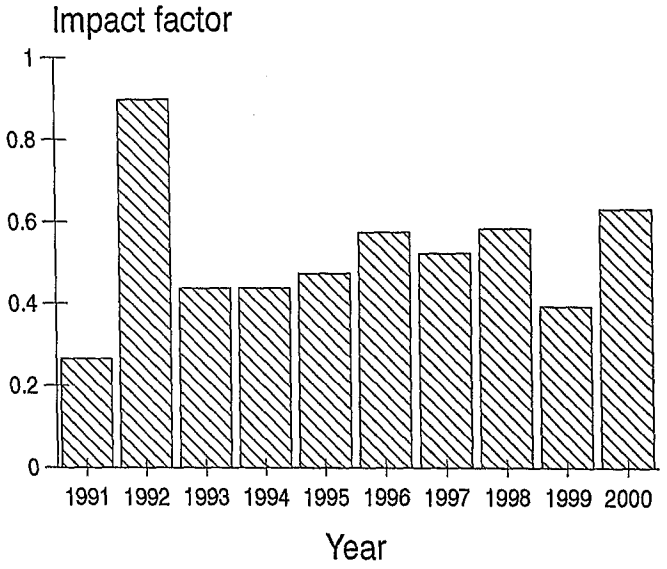


Figure 6. Impact factors of the Netherlands Journal of Agricultural Science over the period 1991–2000. Source: ISI, Journal of Citation Reports.

submitted papers therefore vary with trends in science. Moreover, the link of the journal with its mother organization is weak and the membership of the Royal Netherlands Society for Agricultural Sciences (or the alumni population of Wageningen University) is not clearly reflected in the contributions to the journal.

The Netherlands Journal of Agricultural Science would like to become the main scientific platform for research that can be classified as typically representative for the Wageningen school of agricultural science. This includes at least the following:

- multidisciplinary in its approach;
- interdisciplinary (including beta-gamma interactions) in its methodology;
- quantitative (based on system analysis and modelling) in its analysis.

In another paper in this issue (Jongen *et al.*, 2002) we will elaborate this focus in more detail.

## Reference

Jongen, W.M.F., P.C. Struik & J.F. Wienk, 2002. A new scope for the Netherlands Journal of Agricultural Science. *NJAS, Wageningen Journal of Life Sciences* 50: 261–265.

# Appendix

The twenty-five articles most frequently cited in the period 1987–2001, ranked on the basis of the number of citations per year.

| Article | Subject | Citations | Citations per year |
|---|---|---|---|
| Brouwer, R., 1983. Functional equilibrium; sense or nonsense? NJAS 31: 335–348. | Plants | 137 | 9.79 |
| Goudriaan, J. & H.E. De Ruiter, 1983. Plant growth in response to CO2 enrichment, at two levels of nitrogen and phosphorus supply. I. Dry matter, leaf area and development. NJAS 31: 157–169. | Plants | 129 | 9.21 |
| Spitters, C.J.T., 1983. An alternative approach to the analysis of mixed cropping experiments. I. Estimation of competition effects. NJAS 31: 1–11. | Plants | 119 | 8.50 |
| Brouwer, R., 1962. Nutritive influences on the distribution of dry matter in the plant. NJAS 10: 399–408. | Plants | 102 | 7.29 |
| Aarts, H.F.M., E.E. Biewinga & H. Van Keulen, 1992. Dairy farming systems based on efficient nutrient management. NJAS 40: 285–299. | Animals | 71 | 7.10 |
| Verberne, E.L.J., J. Hassink, P. De Willigen, J.J.R. Groot & J.A. Van Veen, 1990. Modelling organic-matter dynamics in different soils. NJAS 38: 221–238 | Soils | 80 | 6.67 |
| Novozamsky, I., R. Van Eck, J.Ch. Van Schouwenburg & I. Walinga, 1974. Total nitrogen determination in plant material by means of the indophenol-blue method. NJAS 22: 3–5. | Plants | 80 | 5.71 |

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|---|---|---|---|
| Schindler, P.W., P. Liechti & J.C. Westall, 1987. Adsorption of copper, cadmium and lead from aqueous solution to the kaolinite/water interface. NJAS 35: 219–230. | Soils | 78 | 5.57 |
| Spiertz, J.H.J. & J. Ellen, 1978. Effects of nitrogen on crop development and grain growth of winter wheat in relation to assimilation and utilization of assimilates and nutrients. NJAS 26: 210–231. | Plants | 75 | 5.36 |
| Tamminga, S., A.M. Van Vuuren, C.J. Van Der Koelen, R.S. Ketelaar & P.L. Van Der Togt, 1990. Ruminal behavior of structural carbohydrates, nonstructural carbohydrates and crude protein from concentrate ingredients in dairy-cows. NJAS 38: 513–526. | Animals | 63 | 5.25 |
| Aarts, H.F.M., B. Habekotté, G.J. Hilhorst, G.J. Koskamp, F.C. Van Der Schans & C.K. De Vries, 1999. Efficient resource management in dairy farming on sandy soils. NJAS 47: 153–167. | Animals | 15 | 5.00 |
| Penman, H.L., 1956. Evaporation: an introductory survey. NJAS 4: 9–29. | Meteorology | 65 | 4.64 |
| Spiertz, J.H.J., 1977. The influence of temperature and light intensity on grain growth in relation to the carbohydrate and nitrogen economy of the wheat plant. NJAS 25: 182–197. | Plants | 58 | 4.14 |
| Brussaard, L., L.A. Bouwman, M. Geurs, J. Hassink & K.B. Zwart, 1990. Biomass, composition and temporal dynamics of soil organisms of a silt loam soil under conventional and integrated management. NJAS 38: 283–302. | Soils | 46 | 3.83 |
| Wilson, J.R., B. Deinum & F.M. Engels, 1991. Temperature effects on anatomy and digestibility of leaf and stem of tropical and temperate forage species. NJAS 39: 31–48. | Plants | 37 | 3.36 |

| | | | |
|---|---|---|---|
| Jongbloed, A.W. & P.A. Kemme, 1990. Apparent digestible phosphorus in the feeding of pigs in relation to availability, requirement and environment.1. Digestible phosphorus in feedstuffs from plant and animal origin. NJAS 38: 567–575. | Animals | 38 | 3.17 |
| Hiemstra, T., W.H. Van Riemsdijk & M.G.M. Bruggenwert, 1987. Proton adsorption mechanism at the gibbsite and aluminium oxide solid/solution interface. NJAS 35: 281–293. | Soils | 42 | 3.00 |
| Lexmond, T.M., 1980. The effects of soil pH on copper toxicity to forage maize grown under field conditions. NJAS 28: 164–183. | Soils | 42 | 3.00 |
| Darwinkel, A., 1978. Patterns of tillering and grain production of winter wheat at a wide range of plant densities. NJAS 26: 383–398. | Plants | 41 | 2.93 |
| Den Hartog, L.A. & G.J.M. Van Kempen, 1980. Relation between nutrition and fertility in pigs. NJAS 28: 211–227. | Animals | 41 | 2.93 |
| Miedema, R., Th. Pape & G.J. Van De Waal, 1974. A method to impregnate wet soil samples, producing high-quality thin sections. NJAS 22: 37–39. | Soils | 41 | 2.93 |
| Booij, R., A.D.H. Kreuzer, A.L. Smit & A. Van Der Werf, 1996. Effect of nitrogen availability on dry matter production, nitrogen uptake and light interception of Brussels sprouts and leeks. NJAS 44: 3–19. | Plants | 17 | 2.83 |
| Kemp, A. & M.L. 'T Hart, 1957. Grass tetany in grazing milking cows. NJAS 5: 4–17. | Animals | 39 | 2.79 |
| Goudriaan, J. & H.H. Van Laar, 1978. Calculation of daily totals of the gross CO2 assimilation of leaf canopies. NJAS 26: 373–382. | Plants | 38 | 2.71 |
| Lenis, N.P., 1989. Lower nitrogen-excretion in pig husbandry by feeding – current and future possibilities. NJAS: 37: 61–70. | Animals | 34 | 2.62 |